

CLAIMS

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A1 >

1. An infrared imaging device, comprising:  
an infrared detector;  
an optical system for causing an infrared radiation  
5 from an object to form an image on the infrared detector;  
shutting means configured so that the shutting means  
can be opened/closed and so as to shut off an infrared  
radiation coming into the optical system when the shutting  
means is closed; and  
10 correction means for correcting an output of the  
infrared detector,  
wherein the correction means determines a correction  
coefficient for correcting fluctuations in an amount of  
infrared radiation from the optical system by using an output  
15 of the infrared detector imaging the shutting means while the  
shutting means is closed.

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2. The infrared imaging device of claim 1, wherein  
the correction means determines a second correction  
coefficient for correcting variations in a DC offset among  
20 pixels and fluctuations in an amount of infrared radiation  
from the optical system by using the output of the infrared  
detector imaging the shutting means being closed and a first  
correction coefficient proportional to a sensitivity of each  
pixel of the infrared detector and shading.

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3. The infrared imaging device of claim 2, wherein:  
the infrared imaging device comprises second shutting

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~~means configured so that the second shutting means can be~~  
opened/closed and so as to shut off an infrared radiation  
coming into the optical system when the second shutting means  
is closed; and

5           the correction means determines the first correction  
coefficient by using the output of the infrared detector  
imaging the shutting means being closed and an output of the  
infrared detector imaging the second shutting means being  
closed.

10           4. The infrared imaging device of claim 2, wherein:  
the infrared imaging device comprises temperature  
setting means for setting a temperature of the shutting  
means; and

15           the correction means determines the first correction  
coefficient by using an output of the infrared detector  
imaging the shutting means being closed, which has been set  
to a first temperature by the temperature setting means, and  
an output of the infrared detector imaging the shutting means  
being closed, which has been set to a second temperature by  
20 ~~the temperature setting means.~~

5. The infrared imaging device of claim 1, wherein:  
the infrared imaging device comprises temperature  
measurement means for measuring a surface temperature of the  
shutting means; and

25           the correction means determines the correction  
coefficient by using a temperature measured by the

temperature measurement means.

6. The infrared imaging device of claim 1, wherein the optical system is set to a non-focused state while the shutting means is closed.

5           7. The infrared imaging device of claim 1, wherein the shutting means is a flat-plate member having a uniform temperature distribution.

8. The infrared imaging device of claim 1, wherein:

09333444-3 "091207" 10           the infrared imaging device comprises temperature setting means for setting a temperature of the shutting means; and

15           the temperature setting means sets the temperature of the shutting means to a temperature in a vicinity of a temperature of a particular object to be imaged while the shutting means is closed.

9. An infrared imaging device to be installed in a moving object, the infrared imaging device comprising:

an infrared detector;

20           correction means for correcting an output of the infrared detector; and

25           control means for controlling a timing at which the correction means determines a correction coefficient based on a signal sent from at least one of the following means provided in the moving object: means for detecting a speed of the moving object; means for identifying a traffic signal of a traffic light located in a traveling direction of the

moving object; and means for determining presence/absence of an object to be detected in the traveling direction of the moving object.

10. A vehicle having the infrared imaging device of  
5 claim 9, the vehicle comprising means for detecting a speed of the vehicle,

wherein the control means provided in the infrared imaging device receives an output signal of the speed detection means to control the timing at which to determine  
10 the correction coefficient.

11. A vehicle having the infrared imaging device of claim 9, the vehicle comprising means for identifying a traffic signal of a traffic light located in a traveling direction of the vehicle,

15 wherein the control means provided in the infrared imaging device receives an output signal of the traffic light identification means to control the timing at which to determine the correction coefficient.

12. A vehicle having the infrared imaging device of  
20 claim 9, the vehicle comprising means for determining presence/absence of an object to be detected in a traveling direction of the vehicle,

wherein the control means provided in the infrared imaging device receives an output signal of the object  
25 determination means to control the timing at which to determine the correction coefficient.

13. An infrared imaging device to be installed in a vehicle, the infrared imaging device comprising:

an infrared detector;

an optical system for causing an infrared radiation  
5 from an object to form an image on the infrared detector; and

a temperature retaining structure for stabilizing a temperature in a vicinity of the infrared detector and the optical system by using a mechanism in the vehicle.

14. The infrared imaging device of claim 13, wherein  
10 the temperature retaining structure circulates an engine coolant of the vehicle in the vicinity of the infrared detector and the optical system.

15. A vehicle, comprising:

an infrared imaging device; and

15 a temperature retaining structure for stabilizing a temperature in a vicinity of the infrared imaging device by using a mechanism in the vehicle.

16. The vehicle of claim 15, wherein the temperature retaining structure circulates an engine coolant of the  
20 vehicle in the vicinity of the infrared imaging device.

17. An infrared imaging device to be installed in a vehicle, the infrared imaging device comprising a mechanism for setting/changing a imaging direction of the infrared imaging device,

25 wherein the mechanism sets the imaging direction toward outside of the vehicle during a normal operation, and

sets the imaging direction toward a part of the vehicle,  
which is to be a temperature reference, during a calibration  
operation.

18. A vehicle, comprising:

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an infrared imaging device; and

a mechanism for setting/changing a imaging direction  
of the infrared imaging device,

wherein the mechanism sets the imaging direction  
toward outside of the vehicle during a normal operation, and  
sets the imaging direction toward a part of the vehicle,  
which is to be a temperature reference, during a calibration  
operation.

19. An infrared image adjustment device for adjusting  
a display temperature range of an infrared image, comprising:

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first means for detecting, from the infrared image,  
an upper limit and a lower limit of a temperature range  
suitable for displaying the infrared image;

second means for storing a predetermined temperature  
based on a particular object to be imaged; and

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third means for setting the display temperature range  
so as to include at least the predetermined temperature,  
based on the upper and lower limit temperatures detected by  
the first means and the predetermined temperature stored in  
the second means.

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20. The infrared image adjustment device of claim 19,  
wherein:

the second means stores, as the predetermined temperature, an upper limit and a lower limit of a temperature range based on the particular object to be imaged; and

5 the third means sets, as an upper limit of the display temperature range, a larger one of the upper limit temperature detected by the first means and the upper limit temperature stored in the second means, while setting, as a lower limit of the display temperature range, a smaller one  
10 of the lower limit temperature detected by the first means and the lower limit temperature stored in the second means.

21. The infrared image adjustment device of claim 19, wherein the first means detects a highest temperature and a lowest temperature among temperatures indicated by the  
15 infrared image as an upper limit and a lower limit, respectively, of the temperature range.